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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte UMBERTO BENATTI, GIORGIO BRANDI, ENRICO GARACI, MAURO MAGNANI, ENRICO MILLO, ANNA TERESA PALAMARA, and LUIGIA ROSSI

Appeal 2011-000059
Application 10/584,874
Technology Center 1600

Before DONALD E. ADAMS, ERIC GRIMES, and MELANIE L. McCOLLUM, Administrative Patent Judges.

GRIMES, Administrative Patent Judge.

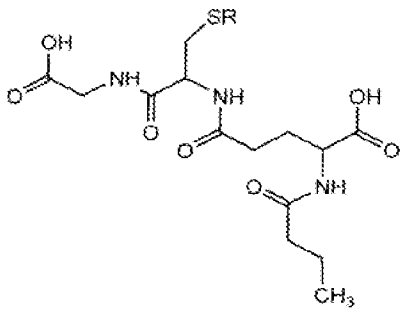
DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to compositions comprising a glutathione derivative, which the Examiner has rejected as obvious. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Claims 15, 17, 18, and 23 are on appeal. The claims stand or fall together (Appeal Br. 8; 37 C.F.R. § 41.37(c)(1)(vii)). Claim 15 is representative and reads as follows:

15. A glutathione derivative having a formula:



wherein R is H or acetyl.

Issue

The Examiner has rejected claims 15, 17, 18, and 23 under 35 U.S.C. § 103(a) as being obvious in view of Anderson[1] and McMurry[2] (Answer 3). The Examiner finds that Anderson discloses "N-acyl glutathiones as a type of glutathione derivative" in which the acyl group has "preferably 1 to 4 carbon atoms, for example propyl" (Answer 3). The Examiner finds that Anderson discloses that "acylated [glutathione] esters are de-esterified in the cell" (id. at 4). The Examiner finds that Anderson a chemical structure in which "[w]hen R1 is propyl and the compound is de-esterified … or hydrolyzed … as described by Anderson et al the resulting product is a carboxylic acid that is identical to the elected species of claim 15 of the

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[1] Anderson et al., US 5,464,825, issued Nov. 7, 1995.
[2] McMurry, Organic Chemistry 4th Edition, p. 825 (1996).

instant invention where R is H" (id. at 4-5). The Examiner finds that McMurry discloses that "esters are hydrolyzed to form carboxylic acids" (id. at 4).

Appellants contend that (i) the compound of claim 1 would not have been obvious because Anderson discloses that the ester group of its compounds is necessary for transport into cells (Appeal Br. 16-20) and (ii) that any prima facie case of obviousness has been overcome with a showing of unexpected results (id. at 22-25).

The issues presented are: Does the evidence of record support the Examiner's conclusion that the compound of claim 15 would have been obvious in view of the cited references? and, if so,

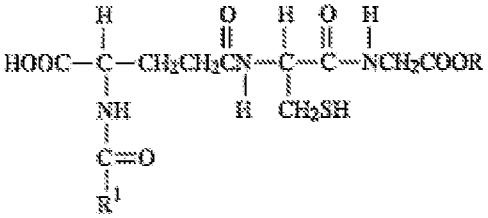
Have Appellants provided evidence of unexpected results that outweighs the evidence supporting the prima case of obviousness?

Findings of Fact

1. Anderson discloses the "use of N-acyl glutathione monoalkyl esters to provide increased intracellular levels of glutathione or glutathione equivalents" (Anderson, abstract).

2. Anderson discloses the administration of its glutathione derivatives for treating AIDS and other viral infections (id. at col. 3, ll. 11-17).

3. Anderson discloses that its alkyl monoesters of N-acyl glutathione have the following structure:



"wherein R is an alkyl group containing 1 to 10 carbon atoms, and R^1 is hydrogen or an alkyl group containing 1 to 9 carbon atoms" (id. at col. 4, ll. 10-18).

4. Anderson discloses that "R^1 above, (when not hydrogen) is … [an] alkyl group of 1 to 9 carbon atoms, preferably 1 to 3 carbon atoms" (id. at col. 4, ll. 44-47).

5. Anderson discloses that its "acylated [glutathione] esters are transported into cells … and are de-esterified and de-acetylated [sic, deacylated] within the cells, leading to increased cellular levels of GSH. NAG [N-acyl GSH] and GSH monoester are also formed in the cells." (Id. at col. 3, ll. 27-30.)

6. When Anderson's compounds are de-esterified, the -COOR (ester) moiety is replaced with a -COOH (carboxylic acid) moiety. See id. at col. 3, ll. 26-27 ("the esterification occurring at the glycine carboxylic acid group") and col. 4, ll. 19-24 (showing that hydrolysis of "N-acetyl [sic, N-acyl] GSH monoester" yields "N-acyl GSH").

7. McMurry discloses that esters are hydrolyzed to yield carboxylic acids and alcohols (McMurry 825).

Analysis

Claim 15 is directed to a glutathione derivative which, when R is H, is an N-acyl glutathione, having a three-carbon (propyl) group as hydrocarbon portion of the N-acyl group.

Anderson discloses N-acyl glutathione derivatives in which the hydrocarbon portion of the N-acyl group preferably has 1-3 carbon atoms. Anderson's derivatives are also esterified, but Anderson discloses that the

esterified derivatives are transported into cells where they are de-esterified and de-acylated, leading to increased cellular levels of, among other things, (de-esterified) N-acyl GSH. Thus, Anderson suggests "a method for increasing … intracellular levels of … N-acyl glutathiones" (Anderson, col. 3, ll. 22-24) – including the compound of claim 15 – "by administering an alkyl monoester of N-acyl glutathione" (id. at col. 3, ll. 25-26), because Anderson's compound is transported into cells where it is converted to the compound of claim 15. Thus, Anderson would have made obvious the compound of claim 15. The disclosure of McMurry is cumulative.

Appellants, however, contend that the compound of claim 15 would not have been obvious because Anderson discloses that the ester group of its compounds is necessary for transport into cells (Appeal Br. 16). Appellants argue that Anderson "explicitly discourages" de-esterification of its compound, as required to reach the compound of claim 15, because it teaches that non-esterified GSH is not transported into cells (id. at 19-20).

This argument is not persuasive. Claim 15 is directed to a compound, not a method of administering a compound. Anderson discloses that the compound of claim 15 inherently results from de-esterification of the esterified derivatives inside a cell, and thus Anderson suggests the compound of claim 15. The scope and content of the prior art includes compounds produced in vivo. See Schering Corp. v. Geneva Pharmaceuticals Inc. 339 F.3d 1373, 1379-80 (Fed. Cir. 2003) (holding compound claims to be inherently anticipated where the evidence showed that a prior art compound is converted in vivo into the claimed compound). We note that claim 15 is not directed to an isolated glutathione derivative,

but only to a compound per se; specifically, the glutathione derivative that would inherently be formed by carrying out the suggestions and preferences taught by Anderson.

Appellants also argue that they have presented evidence of unexpected results sufficient to overcome the prima facie case of obviousness (App. Br. 22). Appellants argue that, in contrast to Anderson, "unexpectedly and unpredictably, the glutathione derivatives of claim 15 do not require an esterified glycine residue, but perform effectively when a second carboxyl group is present on this residue" (id.). Thus, as we understand it, Appellants' position is that it was unexpected that the compound of claim 15 would be transported into a cell efficiently.

Appellants' argument is not persuasive. Anderson discloses that unmodified GSH is not transported into cells (Anderson, col. 8, ll. 10), but the acylated monoester of GSH is (id. at col. 3, ll. 65-66). Anderson also implies that the non-acylated monoester of GSH is transported into cells as well (see id. at col. 2, ll. 60-61: "The administration of GSH monoesters increases cellular GSH in many cells"; col. 3, ll. 48-50: "The N-acyl glutathione esters of the present invention have the same utilities described [previously] for the monoesters").

However, Anderson does not address whether an acylated, non-esterified GSH derivative (i.e., the claimed GSH derivative) would have been expected to be transported into cells. That is, Anderson does not disclose that the transport properties of an acylated, non-esterified GSH derivative would have been expected to be more similar to those of unmodified GSH or to those of a non-acylated monoester of GSH.

Anderson, therefore, does not provide an adequate basis for concluding that transport of the claimed compound into cells would have been unexpected. See Pfizer, Inc. v. Apotex, Inc., 480 F.3d 1348, 1371 (Fed. Cir. 2007) ("[B]y definition, any superior property must be unexpected to be considered as evidence of non-obviousness.").

For their part, Appellants do not point to any evidence of record to show that the transport of the claimed GSH derivative into cells was unexpected. Although Appellants argue that this was the case, attorney argument is not evidence. In re Pearson, 494 F.2d 1399, 1405 (CCPA 1974). Because Appellants have not shown that the transport of the claimed compound into cells was unexpected, their argument based on unexpected results must fail. See Pfizer, 480 F.3d at 1371 ("Pfizer's evidence must fail because the record is devoid of any evidence of what the skilled artisan would have expected.").

Appellants also argue that they have shown that, unexpectedly, the "propyl group of [the acyl moiety] is important and necessary to achieve the enhanced activity of the present compounds. In particular, appellants have shown that an acetyl group (2 carbons) is inactive." (Appeal Br. 22.)

This argument is also not persuasive. Anderson indicates a preference for an alkyl group of 1 to 3 carbon atoms in its acyl moiety; i.e., a methyl, ethyl, or propyl group. Based on Anderson's disclosure, a skilled worker would have reasonably expected compounds with any of these acyl groups to increase intracellular GSH and effectively treat viral infections. Although the Specification discloses that GSH-C4 (a GSH derivative with a propyl group in the acyl moiety) inhibited Sendai virus replication more effectively

than a derivative (GSH-C2) with a shorter alkyl chain in the acyl group (Spec. 13-14), the Specification does not state that this particular result was unexpected. Nor would it appear to be so in view of Anderson's teachings; at most, the results would seem to show that derivative with the shorter alkyl chain was less effective than would have been expected. The burden of demonstrating unexpected results rests on the party asserting them. In re Klosak, 455 F.2d 1077, 1080 (CCPA 1972). That burden has not been carried here because attorney argument is not evidence.

Conclusion of Law

The evidence of record supports the Examiner's conclusion that the compound of claim 15 would have been obvious in view of the cited references. Appellants have not provided evidence of unexpected results that outweighs the evidence supporting the prima facie case of obviousness.

SUMMARY

We affirm the rejection claims 15, 17, 18, and 23 under 35 U.S.C. § 103(a).

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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